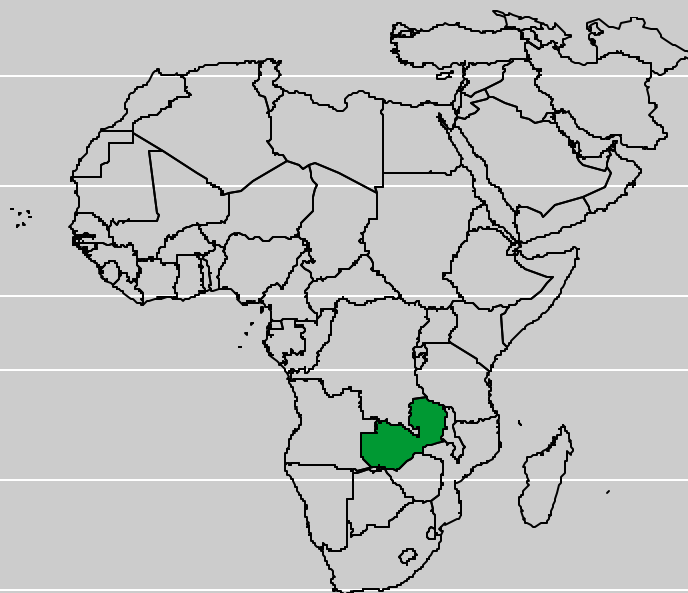


# *Vulnerability Assessment & Mapping Report: 1998*

## ***Vulnerability Assessment & Mapping Report: 1998***

*A Comparative Analysis of the Vulnerability Conditions of Rural Zambia.*



***Prepared by***

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## PREFACE

The 1998 Vulnerability Assessment and Mapping Report is an update to the 1997 VAM with a similar methodological process and approach. The main significant difference however, is the addition of the contribution of wild foods to total income, which was not included in the 1997 VAM. As has been the tradition, this product has been the combined effort of a number of institutions that make up the VAM Steering Committee. These are:

The Ministry of Agriculture, Food and Fisheries; Database Management & Early Warning Unit.  
Food, Health and Nutrition Information System (FHANIS)  
Zambia Meteorological Department  
USAID- Famine Early Warning System  
Programme Against Malnutrition (PAM)  
Care International in Zambia  
Africare  
World Food Programme

Various institutions and individuals have in the past used the output of the VAM analysis and the committee is hoping that this particular report will be as useful. The committee would like mention that the preliminary results from this particular report have this year been used to identify areas, which have been categorised as highly vulnerable. These results helped the National Early Warning Unit to conduct area specific actual food needs assessments. This has been a major role played by the VAM 1998, and the Committee is proud that a major and immediate activity has been achieved using this report. We as a committee are hopeful that the report will in future receive wider acceptability and use, particularly to enhance further and future research in areas identified by the report.

The VAM Steering Committee would like to thank all institutions as well as individuals who contributed to the completion of this report. We strongly believe that this report presents very useful information on historical as well current food security/vulnerability conditions of the people in rural Zambia. We have also attempted to compare the results obtained during field investigations in selected districts at household level with the findings of the VAM. We hope that you will find the report useful as well as a helpful source of information on food availability and access at both national and district levels.

VAM Steering Committee  
**ZAMBIA**

## EXECUTIVE SUMMARY

1. This report contains findings of the Vulnerability Assessment exercise for the 1998 agricultural season. The main thrust of this report is the assessment of the relative food security conditions of the population at district level. This study looks at all factors and variables that contribute to the general livelihood of the people in Zambia. These factors include contributions of agriculture, wild food gathering, livestock, fisheries, wages and other remittances to total income. Against a background of a minimum income requirement to support basic needs, districts are categorized into those whose population can not afford to support basic livelihood due to low income per capita, and whose incomes are above the minimum requirement, and are able to support their livelihoods.
2. An income-based approach has been used to define levels of vulnerability by district. Agricultural production has been the main contributor to total income and has played a major role in determining vulnerability at district level. It is important to mention that there could also be differences within districts in levels of vulnerability due to differences in asset ownership, as well as productivity by different households.
3. Risks associated with rainfall conditions contributed largely to the general vulnerability of people in most districts. As predicted, rainfall was above normal in most of northern Zambia, thereby causing floods and thereby negatively impacting on crop production. Even fishing which is the main livelihood system was lower than the previous year due to heavy rains. On the other hand, the drought, which persisted in the Southern and Western parts of the country also negatively affected crop production and therefore rendering most of the households as food insecure and highly vulnerable.
4. Comparing this year's income levels to the base period, it is evident that the population is to a larger extent worse off now than before. However, it seems that more farmers have diversified to higher value crops such as soybeans, paprika, and cotton and are now receiving economic prices as opposed to the centrally determined prices during the base period.
5. Most of the districts in the Southern Province, (Kalomo, Choma, Monza, Sinazongwe, Siavonga, Gwembe); Western (Lukulu, Katabo, Senanga, Sesheke); Central (Mumbwa, Kabwe Rural, Serenje); Eastern (Katete, Lundazi); Luapula (Mwense, Chilubi, Luwingu) and Northern (Kaputa and Mbala), have an income per capita that is below minimum income threshold, and have been considered as highly vulnerable to food insecurity.
6. Due to low incomes in some districts, food relief intervention would therefore be required, as any market driven interventions to improve food security would not yield the desired results. Interventions in terms of food relief should initially target those districts with highest levels of vulnerability as indicated above.
7. Other non-farm income generating activities have been prominent in most of the districts and have contributed to the livelihood systems of the people. Most common is fishing in the Northern, Western and Luapula provinces, as well as Sinazongwe and Siavonga districts of Southern Province.
8. Two districts in Southern (Siavonga, and Sinazongwe), Kalabo district in Western Province, Chama, Lundazi and Chadiza districts in Eastern Province, Chilubi and Nchelenge districts in Luapula Province, Kaputa in Northern Province and Zambezi district in North-western Province have been identified as generally inaccessible during this season. This therefore implies that the road infrastructure in these districts is very poor. Therefore, intervention in these areas should be compounded by improvements in infrastructure so as to improve accessibility.
9. For areas that have been identified and targeted as highly vulnerable, a combination of program initiatives such as improvement of livestock population through restocking, improved small-scale fisheries development; improvement of area accessibility to traders and other facilities; as well as improvement of health and nutrition conditions; and

development of irrigation schemes in highly but potentially viable districts, should be encouraged. Also other programs that would enhance crop diversification should be well coordinated, as there are already efforts to enhance this.

10. The VAM results have brought out specific policy implications regarding the following:

- i) **Targeting:** This report has identified that most people in Southern, Western and parts of Luapula provinces are vulnerable to food insecurity. This therefore implies that the distribution of scarce resources should be targeted towards the most vulnerable within these geographical locations. People faced emergency conditions during these periods and whose livelihoods have been eroded over time should be targeted.
- ii) **Monitoring:** For those districts characterized as vulnerable and targeted, periodic monitoring is essential. The would require specific monthly field visits to obtain specific information in coping mechanisms of being employed and the impact of intervention strategies in people's livelihood systems.
- iii) **Disaster Management:** This should be strengthened within the newly established Disaster Management and Mitigation Unit at the Office of the Vice President.
- iv) **Market Environment:** The market undoubtedly plays an important part in this system, especially in times of shortfalls. Consideration for provision of credit to local traders in targeted (vulnerable) areas should be considered. Market price information should be widely disseminated.
- v) **Transport and Communications:** The issue of infrastructure (roads, bridges), development especially in districts, which are highly inaccessible, should be brought to the attention of government for intervention.



## TABLE OF ACRONYMS

FAO	Agricultural Organisation of the United Nations
FEWS	Food and USAID/Famine Early Warning System Project
FHANIS	Food, Health And Nutrition Information System
GRZ	Government of the Republic of Zambia
MAFF	Ministry of Agriculture, Food and Fisheries
NDVI	Normalized Difference Vegetation Index
NEWS	National Early Warning System
NEWU	National Early Warning Unit
NGO	Non-Governmental Organisation
PAM	Programme Against Malnutrition
USAID	United States Agency for International Development
VAM	Vulnerability Assessment and Mapping
WFP	United Nations World Food Programme

## Section 1: Introduction to Vulnerability Analysis in Zambia

Zambia's agriculture is largely dependent on small as well as medium scale farmers who contribute approximately 60 percent of maize production and about 75 percent of cash crops such as cotton and tobacco. Because of lack of appropriate technologies such as irrigation, these farmers whose livelihoods depend on agriculture, have more often than not been victims of unfavorable weather patterns. It is therefore important that an assessment of vulnerability is conducted in these communities. It is worthwhile to note that agriculture is the main economic activity in most, if not in all- rural communities and as such, an assessment of agricultural production is a pivot to the general analysis of vulnerability in rural Zambia. This VAM report gives detailed information on conditions of vulnerability as well as food insecurity in all the districts in Zambia. The analysis was based on district level data updated annually to determine the changes of the different indicators. This year's document tries to incorporate some of the missing variables in last year's analysis. The Ministry of Agriculture, Food and Fisheries, Central Statistical Office and Meteorology Department provided most of the data used in the analysis. Since this is an update, a base period of 1985-1995 for crop production has been used whilst the current situation will be analyzed using the 1998 MAFF/CSO Final Crop Forecasting figures and other secondary information.

### **1.1 Framework of Analysis**

Two main aspects define vulnerability in this year's analysis: These are: Risk of exposure to different types of shock or disaster event. Ability of the population to cope with different types of shock or disaster event. The income of households and the assets they hold which may be sold (without damaging their long-term livelihood) in order to purchase food and other necessities creates a central role in this year's vulnerability assessment methodology.

### **1.2 Objectives of the VAM Analysis**

The overall objective of the VAM exercise is to identify areas, which are potentially vulnerable to food insecurity. The analysis also identifies areas for further in-depth household food needs assessment for future food relief and other program interventions. Specific objectives are:

- To assess the physical conditions that affect crop production
- To enhance geographic targeting of vulnerable areas for future intervention.
- To provide an understanding of early warning indicators and to facilitate identification of areas where conditions have improved or deteriorated
- To recommend intervention strategies in the vulnerable areas.

### **1.3 Methodology of Vulnerability Analysis**

#### **1.3.1 Analysis of Risk: Conditions for Food Production**

A number of risk factors were considered in conducting risk analysis in Zambia. The baseline period was compared with the current period to determine the relative change in risk factors and their influence on the overall productivity of the rural population in Zambia. Risk factors included in the analysis were those associated with vegetation levels, drought and/or floods, crop pest infestation, accessibility to major markets, as well as market price changes.

#### **1.3.1.1 Vegetation Levels**

To determine the vegetation levels of the different districts, a Normalised Difference Vegetation Index (NDVI) was used in the analysis. For the current period, differencing NDVI monthly images from the long-term mean (1982-1995) for the corresponding images created six monthly images. These were then classified into three levels of deviation from normal, i.e. above normal, normal, and below normal.

#### **1.3.1.2 Drought/Flood Risk**

To incorporate long term risk analysis, meteorological rainfall data for 53 stations were taken into account and interpolated to form a continuous surface of rainfall values across Zambia. The district boundaries were then used to extract the average rainfall for each district. These were then modified in three ways. An ascending rank was assigned to each district based on average rainfall values. Districts with low rainfall received low ranks while those with higher rainfall received high ranks. The ranked values were re-assigned to the districts, and the districts were clustered into three classes (1-15, 16-30, 31-56). The long term normal rainfall values were classified into three classes based on amount of rainfall received during the year. The class thresholds were <750mm, 750-1250mm, and >1 259mm per year. The rainfall values were scaled to a relatively more absolute scale using a newer technique within Geographical Information Systems. It was assumed that long term rainfall values below 400mm per year were insufficient for production while those over 1,000mm were highly unsuitable for cultivation as it is above the normal rainfall requirement for normal crop growth. The values below 400mm were given a value of 0 while those over 1000mm were given 255. Between these thresholds, the values ranged from 0-255 across a linear scale. In analyzing current risk, 53 stations were used to collect meteorological data for the 1997/98 season from November through to April. These were added to obtain seasonal totals of rainfall. These were then expressed as percentage of long term normal rainfall. District level averages were extracted from these values and ranked in ascending order. Values lower than (<80%) indicated that the 1996/97 rainfall was below normal (risk of drought), 80%-120% indicated normal 1997/98 rainfall (neither drought nor flood risk), and those showing high values (>1 20%) indicating above normal seasonal rainfall (flood risk). Districts were classified into high or low risk of flood or drought based on the magnitude of percentage departures from normal.

#### **1.3.1.3 Pest Infestation and their Occurrence**

Information on crop losses resulting from pest infestation has not been reliable and most cases non-existent particularly during the baseline period. However, some consideration of pest occurrence for the current period was considered during the analysis. It suffices to mention that the overall contribution of this component of risk analysis is not significant due to limitations of data, but conclusions are drawn in areas where substantial information was obtained to determine the effects of pests on food production and availability.

#### **1.3.1.4 Health Conditions (Nutritional Status)**

This factor has been a major determinant of food availability in most areas in Zambia. Most of the economic activities in Zambia are largely influenced by the productivity of the labour (household) and in situations where the health conditions of the members of the households have been poor, productivity of such households has been low.

#### **1.3.1.5 Market Price Changes**

The liberalisation of the economy and particularly crop marketing has introduced another dimension of risk in Zambian agriculture. Whereas during the 1980's and early 1990s, agricultural prices were centrally determined and therefore, price changes were almost non-existent. However, with the liberalisation of the economy, risks due to market price changes have become an important issue, hence it is imperative to assess the effect that these price changes have had on food production as well as accessibility.

#### **1.3.1.6. District Accessibility**

This has of late become an important factor in determining a district's status as far as vulnerability is concerned. Productivity has been a function of a number of factors including accessibility, and therefore its importance cannot be over-emphasised.

### **1.4 Analysis of Coping Ability**

To compare the performance of the different districts, during the current and baseline periods, a Minimum Income Threshold was established. This was calculated using the 1996 Living Conditions Monitoring Survey price data and nutrient intake requirement for the minimum cost of the food basket. The cost is based on a minimum basket of food that will ensure a household of six people the necessary nutrients for a healthy and active life. Different income requirement thresholds were determined for each province. This cost was assumed to be 70% of total household expenditure. (World Bank Development Report, 1996).

### Indicators of Coping Ability

Income Source	Data Used	Method Used for Calculation/Estimation
Income from Crops	Crop Statistics at Provincial and District levels- provided by the Ministry of Agriculture, Food And Fisheries	Maize, sorghum, millet, rice, cotton, sunflower, paddy rice, tobacco, mixed beans, groundnuts, cassava production of small and medium scale farmers for each year 1985 to 1997 were multiplied by the <i>real price</i> of each crop. The total value of crop production summed for each year from 1985 to 1996
Value of livestock	Livestock Statistics at Provincial and District levels- provided by the Ministry of Agriculture, Food And Fisheries,	Livestock population (cattle, goats and sheep, pigs) for each year were multiplied by <i>the real price</i> of livestock per head. The 1997 VAM considers total livestock holding as good determinant of coping ability. Data for some districts for certain years was missing. This was calculated by assigning the average proportion of district holding to the total number of livestock in the province. If on the average, Gwembe has 20% of goat population and southern Province has 10,000-goat population in 1990, then Gwembe has about 0.2110000 or 2,000 goats in 1990.
Income from Fisheries	MAFF Data base of Fisheries production by major catchment area.	Data on fish catches was multiplied by the existing per unit <i>real price</i> of fish to obtain an estimate of income generated from fishing
Income from Transfers	Zambia Household Budget survey	The estimation of income transfers is based on the method used in 19% VAM for calculating income transfers. The major difference is that income is not converted to maize equivalents. The CPI was used to deflated these incomes.
Income from Wild Food Gathering	Estimates based on consumption levels assumed for the rural and urban population.	Consumption was based on the assumption that the population in rural areas consumes approximately 1 kg per person per year while those in urban areas consume about 0.5 kgs per person per year. The prices used are those obtained at district markets for the common wild fruits traded such as masuku, lusala, etc.
Wages and salaries	Based on 1996 VAM	Data as obtained in the Living Conditions Survey of 1996, deflated by the CPI.

## 1.5 Unit of analysis

Vulnerability analysis in Zambia can be done at four levels: national, district, community and household. Each of these different levels is meant to achieve different objectives. The tools of analysis are also different. During the 1995 and 1996 VAM, only the district vulnerability analysis was conducted, as such these reports could not be used to plan projects or activities at the sub-district level. This year's VAM Report is also based on a district level analysis. The analysis is expected to identify food availability and accessibility for the current period as well as the average over a period of ten years. There are now at least 57 districts in the country that have been used for analysis. Due to the heterogeneous groupings that are found in these districts (commercial farmers, subsistence farmers, traders, fishermen, etc), a concise analysis of vulnerability has been rather difficult. However, even more complicating in the analysis is the issue of agro-ecological zones, which cut across district boundaries. These differences within the district will have some influence to the results that were obtained. However, these divergences have not been taken into account in this year's VAM. This year's VAM is therefore a district-based analysis. A lower level analysis of Food Security conditions in selected districts was also conducted by FHANIS and later followed up by field verification trips. Tools such as Rapid

Rural Appraisal techniques were used to collect information in selected districts at household level. The information obtained from this level of analysis included food availability and accessibility as well as estimates of community food requirements.

## Section 2: Resource Availability and Food Production Trends

### 2.1 Overview of Zambia

Zambia is a landlocked country, covering an area of 752,62 square kilometers and lying mainly on a plateau ranging from 900 to 1,500 meters above sea level. It has international borders with eight countries, Tanzania and Zaire to the north; Malawi in the east, Angola and Namibia in the west; and Zimbabwe to the south. The population of Zambia is estimated to be 9.67 million (1997) and the annual growth rate over the last two decades has averaged about 3.2 percent. Administratively, Zambia is divided into 9 provinces and 64 districts. About 60% of the population is concentrated in four provinces (Southern, Central, Lusaka, and Copperbelt) along what is called the Line-of rail. The country's urban population accounts for about 50% of the total, but urbanisation is considerably higher in these four provinces. Zambia lies between 8 and 18 degrees latitude South and 22 and 34 degrees longitude east. The country has a sub tropical climate and vegetation. There are three distinct seasons; the warm-wet season stretching from November through April. During this period 95 percent of the annual precipitation falls. The second season is a cool dry winter season from May to August with the mean temperature varying between 15 degrees Celsius (59 F) and 27 degrees Celsius (80F); and finally a hot dry season during September and October, 27 to 32 C (80 to 90F).

The annual rainfall varies from over 1270mm in the North to about 760 mm in the center and less than 760 mm in the south of the country. Zambia's vegetation may be very broadly classified as woodland Savannah, which are a mixture of various trees, tall grass, herbs and other woodlands which are mainly of the deciduous type to be found on the main plateau. However, these also occur in other areas such as the major maize farming areas of the southern and Lusaka Provinces. Forests occur mainly in the north- western and Western parts of the country. These areas are major sources of timber in Zambia. Thick forests are also to be found in the northern parts of the country. Grasslands occur mainly in the seasonal flood plains in the Western Province, the Kafue flats and Bangweulu Swamps.

Zambia relies on copper and other minerals for over 90% of its foreign exchange earnings. However, the agricultural sector has continued to grow and contribute about 16% to the Gross Domestic Product annually. Zambia's agriculture is predominantly rain-fed and rainfall is one of the major determinants of the sector performance in any given year. Zambia has an estimated 9 million hectares or 12 percent of its total land area, suitable for cultivation and 16 million hectares suitable for rangeland grazing. Zambia can be divided into three agro-ecological zones. Zone 1, which are mainly located in southern areas of Southern and Western Provinces. Zone 2 covers the central belt of the country. It is the most populous zone, with over 4 million inhabitants and has the highest agricultural potential. It has a well-distributed annual rainfall of between 800 to 1000 millimeters and generally good soils. Zone 3 covers large areas of Northern, Luapula and north-western Provinces and has a population of over 3.5 million. Approximately, 700,000 farmers in Zambia can be grouped into three main categories. About 75 percent are small-holders with an average farm size of 2 hectares. An estimated 17 percent are emerging commercial farmers with farms between 10-20 hectares in size. The balance of 8 percent are large commercial farmers with farm sizes exceeding 60 hectares. The commercial farmers are located along the line of rail or near major urban centers.

## 2.2 Main Farming Systems in Zambia

There are basically four main farming systems in Zambia, and each one of them has a particular crop production system. These systems are: -

### i) Plateau Farming System

This is the most productive farming system in the country. There is a high concentration of commercial farmers and is well located along the line of rail with readily accessible markets. The system is mainly found in Northern, Luapula, Central, Western, Copperbelt, Eastern, Northwestern, Lusaka and Southern provinces.

In Western Province, this farming system is mainly on the uplands of the Western Province, mainly in Kaoma district. Agriculture here is largely dependent on rainfall and crops mainly grown include Maize, Cassava, Sorghum, and Millet. Cash crops grown include Cotton and sunflower. There is very little or no fishing in this system, as such people largely depend on agricultural production. Livestock production is very dominant.

In Southern province, the system stretches across the southern part of the country. Agricultural production is basically crop based. Livestock production is also predominant. Most farmers in the province are small scale and medium who largely depend on rain for their agricultural production. Crops mainly grown include maize, sunflower, groundnuts, and cotton. Most commercial farmers in this farming system grow tobacco and coffee.

This farming system is also characterised by a shifting cultivation system commonly known as the chitemene system, and is prevalent in Luapula and Northern Province. The chitemene cropping system is reported to reflect differences in more land and forest resource available. In this system, one can observe the large scale millet based chitemene of the Northern province plateau. Differences also exist in consumption preferences (finger millet is used primarily for nshima.) The main crops grown include Cassava, and millet.

### ii) Lake Farming System

This farming system falls within the fishing/farming dominated systems of Southern, Luapula, and Northern Provinces. These inhabitants depend on fish from the fishermen, while crop farming is on a small-scale level and for household food security. Livestock production is on the increase in both the southern and the northern parts of this farming system. This is because of the current livestock development activities going on in these provinces.

### iii) Valley Farming System

The population in this farming system is found in Luapula, Southern as well Western Provinces. In Luapula province particularly, the population has been increasing due to the proximity to the trading areas of the Democratic Republic of Congo. This concentration and increase of population coupled with poor management of resources (forests, soils) renders large parts of the sub system within the province to be vulnerable to food insecurity. In addition, the population increases and concentration has caused the enormous fertile land shortages around the settlement. Cassava production is now becoming dominant as farmers are now shifting from maize production. Groundnut production is also on the increase due to the local and external (Mansa and DRC) markets. Finger-millet is reported to be on the decrease due to several factors, notable amongst these being the shift in emphasis over the last few years to maize growing, however there are indications that this trend is being reversed. Secondly, the poor performance of finger millet when grown on permanent fields. Sweet potatoes production is reported to be on the increase due to the available local and external markets. Forest resources are on the decline. Fisheries resources are almost depleted. Wildlife is almost non existent.

In the Southern Province, this farming system largely covers the valley areas of the lower Zambezi. There is very little agriculture here, as such food deficits are chronic and the inhabitants are always vulnerable to food insecurity. Crops



produced include sorghum, millet, sunflower and cotton. Fishing is also quite predominant in this farming system. There is a good number of livestock in the area, which have been used to support the livelihood system in these areas.

#### **iv) Lowland/River Basin Farming System**

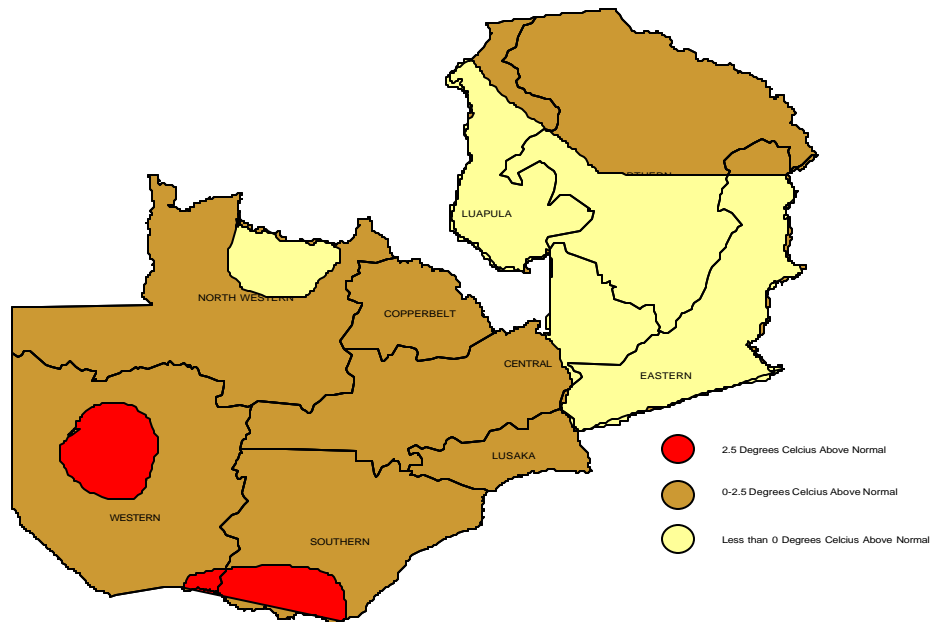
This farming system is mainly found in the Western province. It is the main food system in the Western Province. Three-quarters of the inhabitants of the province heavily rely on this system. It is a combination of winter agriculture as well as fishing. It is the most productive system in the province. Due to the high fertile soils, agricultural output is normally high. Crop production is mainly done during the winter such that by the onset of the rainy season, the crops are ready for harvest. This has enabled the people in these areas to be less vulnerable to food insecurity for most of the year. However, floods have also heavily hit this system during years of heavy rainfall. Because of this peculiar nature, people have argued that this system is highly risk prone. Fishing is very dominant, and is a source of income for the inhabitants. Crops grown include maize, cassava, millet and sorghum. Livestock production is also predominant in this system.

### **2.3 *National and Provincial Food Availability Position.***

#### **2.3.1 Meteorological Conditions during 1997/98 agricultural season**

A large proportion of the total cultivable land in Zambia is characterized by rain-fed agriculture. Variations in rainfall pattern translate into pronounced fluctuation in crop production. Zambia is located in a region that suffers recurrent precarious weather pattern. Drought and flood are the two extreme weather conditions that signify the departure of weather pattern from its expected trend resulting in serious consequences. In order to descriptively determine the level of fluctuation of cumulative rainfall from long term mean (covering 30 years period) at any stage of the season, the terms such as "normal", "below " and "above normal" rainfall are used. During the month of November the extreme south-western part of Zambia experienced maximum temperatures greater than 1.5 degrees Celsius above normal, whilst much of the remainder of the country recorded temperatures in the range of 0-1.5 degrees Celsius above normal. During the month of December maximum temperatures were higher than in November, with the area around Livingstone and Mongu experiencing temperatures greater than 2.5 degrees Celsius above normal. Much of Luapula and Eastern Provinces including Luwingu, Chilubi, Mpika and Serenje districts reported temperatures below normal. The rest of the country had temperatures of 0-2.5 degrees Celsius above normal.

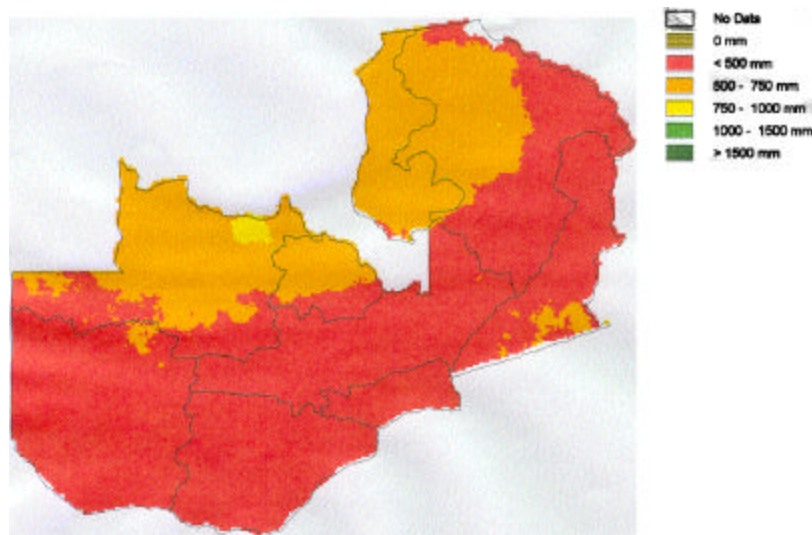
**Figure1: Temperature Situation during the 1997/98 Agricultural Season.**



### **2.3.2 Rainfall Performance during the 1997/198 growing season**

The sowing rains which started in the 2nd dekad of November, were not sustained in main area of Zambia especially the western half which experienced erratic rains as the season progressed, causing delay in planting and poor germination of crops. The severely hit areas were Southern Province and southern districts of Western Province. In many areas, widespread planting started in the third dekad of December. The map below shows the rainfall distribution during the growing season.

**Figure 2: 1997/98 Agricultural Season Cumulative Rainfall**



#### **2.3.2.1 Northern Province**

Rainfall performance during the second dekad of November was very poor over the northern half of the province. December and January were the wettest months in the province, characterized by continuous and heavy rainfall causing destruction to crop and infrastructure due to flash floods. Significant reduction of rainfall started in the first dekad of March in many areas of the province except in Kasama District which recorded the heaviest rainfall of up to 268 mm in 8 days period

#### **2.3.2.2 Luapula Province**

Heavy rainfalls coupled with extensive floods were experienced during the months of December, January and February, seriously impeding agricultural operations. The destructive nature of this type of rainfall caused a lot of damage to crops and infrastructure in the province.

#### **2.3.2.3 Eastern Province**

Adequate rains started during the second dekad of November. However heavy rainfall was experienced during the month of December and January. In many parts of the province especially in the valley, flooding was experienced especially in low-lying areas.

#### **2.3.2.4 Copperbelt Province**

The planting of both maize (mm 604) and groundnuts started in the second dekad of November, the time when sowing rains were also received. The excessive rainfall that characterized the province from the start of the season up to second dekad of March has however been of great concern to agriculture and infrastructure in general. Most areas especially along the Kafue River bank have experienced unprecedented flooding, submerging crops, and roads and people's houses.

#### **2.3.2.5 North Western Province**

Northwestern Province has received the heaviest rainfall this season. This has resulted in widespread flooding in the area, destroying crops, roads and people's houses. The sowing rains were received in the second dekad of November except in Zambezi District, which received sowing in the third dekad of November. Most farmers in the province started planing maize as early as the first dekad of November. Cassava crop in some areas like Kabompo was reportedly doing fine by the end of March. It is likely that most of cassava, maize and other crops were adversely affected by continuous heavy downpours that have characterised the province since season started.

#### **2.3.2.6. Western Province**

Most of the low lands areas of the province especially the Bulozhi plains have experienced unprecedented flooding destroying maize and other crops. The overflowing of the Zambezi River is mostly attributed to heavy rainfall in Northwestern Province where its source is. Although the province started receiving rains as early as first dekad of September, the amount and distribution was too scanty to support any agricultural activities. It was not until the second dekad of November that sowing rains set in. Most of the province is endowed with Kalahari sands, which are generally of low water holding capacity. The temporal distribution of rainfall is therefore a critical factor to crop growth and development in such areas. Most crops planted with the first rains are reported to have experienced severe water stress during the prolonged dry spells that characterized the whole province during the first two months (November and December) of the season. The crop situation was worsened by the invasion of rats and locusts in the southern districts. Scanty rains also affected Kaoma district, which is the bread basket for the province.

#### **2.3.2.7 Southern Province**

Southern Province generally received sporadic rainfall during the rain season. Excessive rainfall was experienced generally around the plateau of Mazabuka districts, while in general, rainfall elsewhere was below normal. The valley areas of Sinazongwe, Kalomo and Gwembe districts received well below normal rainfall, hence affecting crop production in the season.

#### **2.3.2.8 Central Province**

The Central Province experienced relatively good rains, though sporadic dry spells were experienced during the month of December. Average rainfall of 800 - 1000 mm was experienced in Serenje and Kapirimposhi districts, while most of Mumbwa district received less than 800mm, thereby, affecting normal crop growth.

### 2.3.2.9 Lusaka Province

Lusaka Province fared well despite erratic rains in some areas. Temporal distribution was favorable for agriculture except in the extreme southern districts of the province which, right from the onset of sowing rains, experienced precarious weather pattern characterized by localized rainfall. Like in Southern Province, some areas were adversely affected by floods whilst others experienced unprecedented prolonged dry spells resulting in crop damage.

## 2.4 National and Provincial Food Availability Position

The FAO Global Food Outlook Report for the 1997 states that the expected cereal production in Southern Africa is expected to reduce from 25.3 million tons in 1997 to 22.6 million tons in 1998 due to the El Nino phenomenon. In Zambia, agricultural production during the 1997/98 season declined when compared to last season and this is mainly due to the El Nino phenomenon. The other critical factors that affected production during this season were; poor infrastructure of feeder roads, the high cost of inputs, none availability of formal credit facilities to smallholder farmers. According to the National Food Balance Sheet, Zambia expects a deficit of 583,000mt of Maize, 29,000mt of Rice and 31,000mt of Wheat. This leaves the Country with a total cereal deficit of 643,000mt.

**Table 1: Projected Annual Balance Sheet for 1998/99 consumption year. ('000 metric tonnes)**

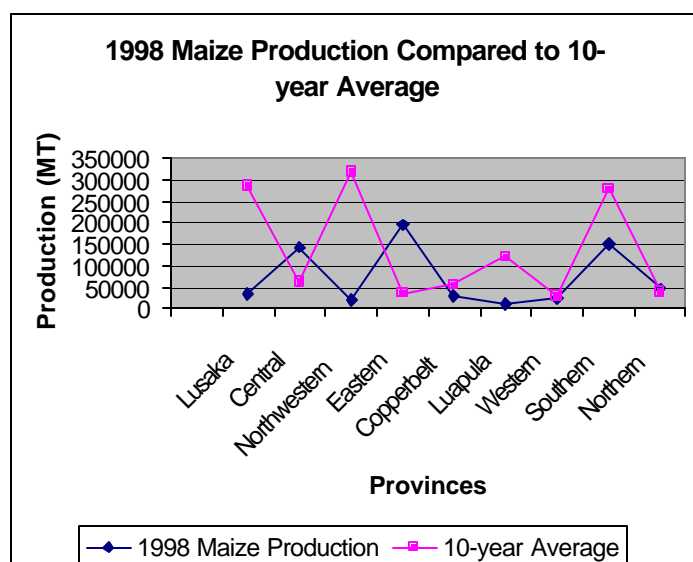
	Maize	Paddy Rice	Wheat	Sorghum/ Millet	Tubers	TOTAL
A. OPENING STOCKS (1 <sup>st</sup> May, 1998) 1/	80	1	25	1		
B. Production (1997/98) 2/	649	6	71	87	1,021	
C. Total Availability 3/	729	7	96	88	1,021	
C. STAPLE FOOD REQUIREMENT						
i) Human Consumption	1,110	35	122	78	868	
ii) Food Reserve Stocks (net) 4/	10	0	0	0	0	
iii) Stock Feeds 5/	30	0	0	0	0	
iv) Breweries 6/	50	0	2	2	0	
v) Seed 7/	10	0	0	1	0	
vi) Exportable/Cross-Border trade 8/	50	0	4	3	0	
vii) Losses 9/	52	1	128	4	153	
Total Requirement	1,312	36		88	1,021	
E. Surplus/Deficit 10/	(583)	(29)	(31)	0	0	(643)
F. Food Relief Requirements						
G. Food Aid Import requirements						
H. Commercial Import Requirement	583	28	31	0	0	

#### Notes:

- 1/. Stocks expected to be held by commodity traders, FRA, millers and commercial farmers as at May, 1998, including stocks held by small-scale farmers in rural areas.
- 2./ Production estimates from the Final Crop Forecasting prepared by CSO and MAFF. Production of Cassava has been estimated on the basis of 7 metric tonnes yield per hectare while production of other tubers has been put on 740,000 metric tonnes based on the study findings by the MAFF.
- 3./ Staple food representing 70% (1,421 kcal/person/day) of total diet (2,030 kcal/person/day) converted to crop requirements over an estimated population of 10 million people. Given the overall maize shortfall, it is assumed that the total production of sorghum and millet, cassava and other tubers are available for consumption and will, to the extent possible provide a substitute for maize.
- 4./ Locally purchased Food Reserve Agency stocks expected to be carried over into the next season. This does not indicate total FRA purchases on the local market nor imports.
- 5./ Requirements by all major stockfeed producers, including large farms.
- 6./ Requirements by all known breweries.
- 7./ Estimated seed crop grown for the seed companies.
- 8./ Total net exports expected on the basis of the demand for food crops in neighboring countries.
- 9./ Losses are estimated at 8 percent for maize and rice and 5 percent for sorghum, millet and wheat and 15 percent for tubers.

**Table 2: A Comparison Between Current Maize Production and a Ten –year Average**

Province	1998 Maize Production (Mt)	10-Year Average	% change
Lusaka	33,364	285,369	-88
Central	142,687	62,582	128
Northwestern	20,287	318,065	-93
Eastern	194,292	34,196	468
Copperbelt	29,493	54,174	-45
Luapula	9,216	120,554	-92
Western	24,158	30,662	-21
Southern	148,651	277,245	-46
Northern	44,111	39,203	12.5
<b>TOTAL</b>	<b>646,259</b>	<b>1,222,050</b>	<b>-47</b>



From the above table, looking at individual provinces, it is evident that maize production in almost all provinces was significantly below average with Central province having the highest deviation from the average. Maize output from Luapula and Southern Provinces was close to normal while Western and North-western Provinces had above normal output. In general, the table implies that the season was below average for all provinces except North-western and Western Provinces. The poor performance could be mostly attributed to too much rainfall in the southern parts of the country on one hand and too little rainfall in parts of northern Zambia as well as problems of access to fertiliser and other inputs for small scale farmers.

## Section 3: Analysis of Results

### **3.1 *Assessment of Risk: Current and Base Period.***

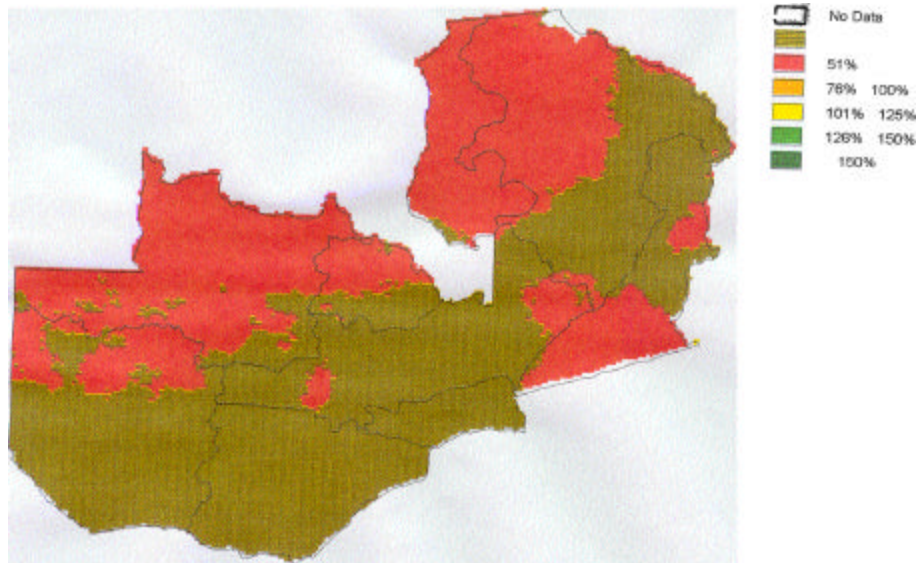
#### **3.1.1 Risk Associated with Flood/Drought**

##### **3.1.1.1 Rainfall Conditions: Departure from Normal.**

The figure 3 below shows the departure from Normal in terms of rainfall conditions during the 1997/98 agricultural season. It is quite observant from the figure that highest departure from normal in terms of rainfall distribution has been in Luapula, some districts in Northern as well as Northwestern as well as some districts on Copperbelt Provinces. This indicates the extensive amounts of rainfall that were received in these districts during the season. Chipata, Lundazi as well as Petauke districts in Eastern Province also received a lot more rainfall than in a normal year.

On the other hand, all of Southern , Lusaka and Central Provinces, most of Western Province, and a few districts in Northern and Eastern Provinces (as depicted in the figure below) received less than 50% of the normal rainfall. This, as was observed in the season, caused crop damage in these provinces and reduced household's capacity to feed themselves, and rendered them highly vulnerable to food insecurity.

**Figure 3: 1997/98 Agricultural Season Cumulative Rainfall: Departure from Normal**

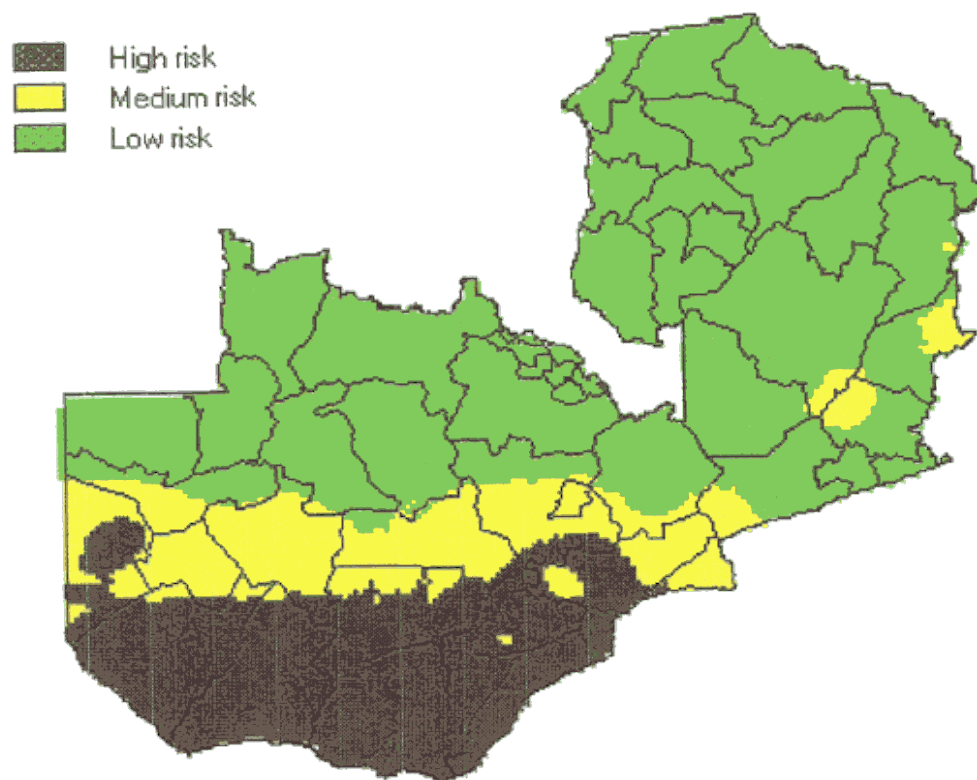


Observing from figure 4 below, it is quite evident that over the past 30 years, the rainfall distribution over Zambia has been reducing. More areas are now at high risk of either floods or drought. The analysis of a 30 year long-term rainfall risk, shows that over the 30 year period until 1996, all of Northern, Luapula and Northwestern provinces and some districts of Central Province have been at low risk of either floods or drought, while most of Central Province and some districts in Western Province have had medium risk. All of southern Province, however, has been at high risk of either flood or drought.

Though, most of the districts particularly Southern Province has been at high risk (if you compare with the rainfall distribution over the past two years), it is important to note that more districts are beginning to enter into the high-risk zone. This is true particularly over the past three seasons. This has a serious implication on household's livelihoods and planning. It is also more important on the part of government and other participants to continually widen their targets to areas that have been perceived over the long-run as low risk areas, in programs such as soil conservation and water catchment initiatives.



Figure 4: Long-Term Risk: 30 Year Mean Rainfall Distribution



#### 3.1.1.2 Risk Associated with Vegetative Conditions (NDVI Analysis)

A Composite 1997/98 Normalized Difference Vegetative Index indicates that during the season, most of Zambia high to very high vegetation. However, most of the Western Province, particularly along the Zambezi Valley, there was medium to very low vegetation due to floods. This phenomenon is true considering the amounts of rainfall that was received in the catchment areas of Northwestern Province. Crop Production in Western Province was affected negatively so was livestock, given the fact that there were few grazing areas.

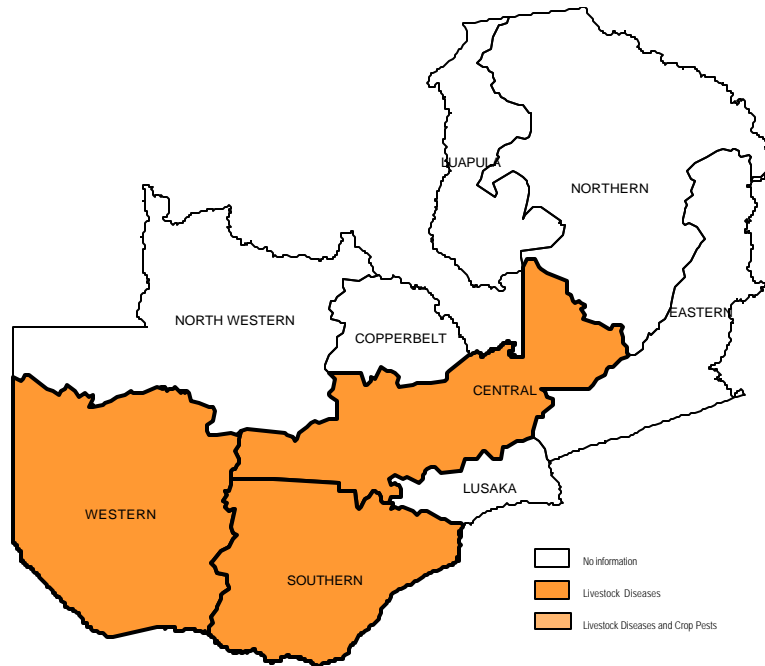
Of particular relation to this analysis is the livelihoods of households as regards to coping mechanisms derived from production or sale of livestock. As most of the country had good vegetation during the period, it suffices to conclude that livestock, both small as well as large, benefited from the high vegetation coverage. It is expected that livestock had enough grazing fields.

### **3.1.3 Risk Associated with Pest Infestation.**

As indicated in the 1997 VAM Analysis, there seems to be lack of adequate information to determine the trend of crop as well as livestock disease and the impact of rural agricultural productivity. However, there is enough information to deduce the effect of the pests as well as disease on crop production and loss of livestock during the current period.

During the 1997 VAM analysis, most of Central Province as well as some parts of Southern Province were identified as having been hit by the pests as well as livestock diseases. This was further confirmed by the verification trips that were conducted by members of the VAM Group. However, the current situation indicates that the situation is much worse than last year and has spread to other provinces. During the Foods Needs Assessment field trips conducted by members of the VAM group, in 1998, it was found out that Southern Province, Central Province as well as Western Province were heavily hit by cattle disease. A crop pest such as the large grain borer was reported to be very prevalent in Southern Province. It is imperative therefore to mention that though the analysis of coping ability indicate a large amount of income from livestock sales, the actual amount of livestock with households may be half of what has been used in the analysis. The map below shows provinces with incidences of crop pests and livelihood disease. This phenomenon has had a negative impact on the general vulnerability of the households in these areas.

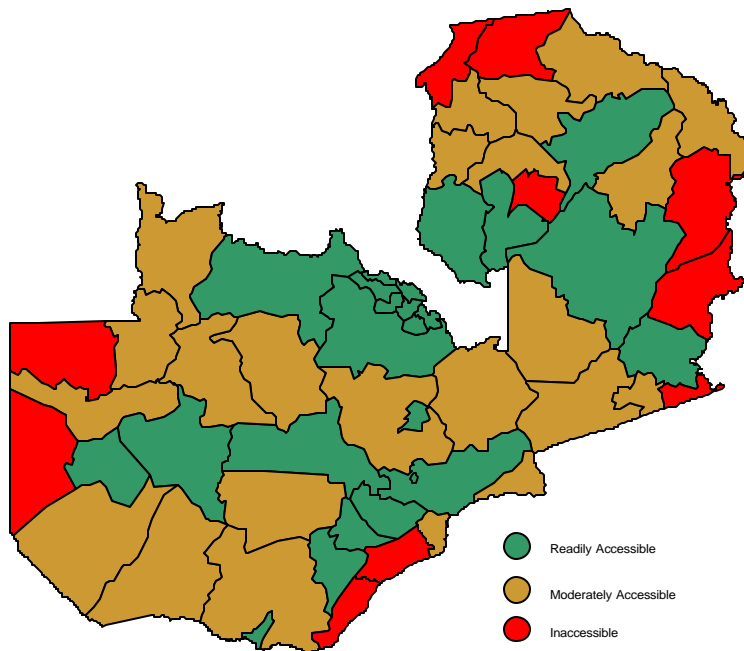
**Figure 6: Livestock Disease and Crop Pest Infestation**



#### **3.1.4 Risk Associated with Accessibility**

Physical access especially to and from district communities/agricultural camps, is an important determinant of the relative condition and status of a given district or area. Though there may be different facets to physical accessibility of a given area, this analysis has mainly concentrated on the findings of the Food Needs assessment which categorized districts/communities to those readily accessible and those which are difficult to access. This has implications on the relative cost to and from these centers. Due to the lack of information of transport rates being applied in each district, this analysis has based its conclusions on the difficulty of accessing these areas and the general and expected implications on the productivity in these areas. The general argument is that, when an area is easily accessible, then inflows of agricultural inputs as well as other facilities can easily get to the area. Agricultural produce from such areas will easily be moved from these areas to the market. Because of this, it is assumed that the general status of the people in these areas will be improved and it is expected that the general vulnerability of these people will be minimised. It is therefore, this argument that forms the basis of the information depicted by the map below:

**Figure 7: Relative Accessibility to District Centers**



From the map above it is therefore important to note the following:

- Most of the districts in the country are moderately accessible. These are basically rural based districts and can easily be reached by either private traders as well agricultural extension workers, etc. It therefore suffices to deduce that most basic services such as health, etc are readily available in these areas.
- All urban-based districts are readily accessible.
- Two districts in Southern (Siavonga, and Sinazongwe), Kalabo district in Western Province, Chama, Lundazi and Chadiza districts in Eastern Province, Chilubi and Nchelenge districts in Luapula Province, Kaputa in Northern Province and Zambezi district in North-western Province have been identified as generally inaccessible during this season. This therefore implies that the road infrastructure in these districts is very poor. It is therefore likely that even accessibility to markets by the population in these areas is low thereby implying that the income levels among these population is low.

### **3.1.5 Risk Associated with Market Price Changes**

The price of white maize ranged from K12, 000 in Kalabo to K44, 250 per 90-kg bag in Gwembe. Maize prices were particularly high on the Copperbelt where an average bag of 90 kg bag of maize was K40, 710 followed by Southern province with a price of K37, 084, Eastern province K33, 313 and Western province K32, 000. Districts, which had a very high maize price with an average price of more than K40, 000 per 90-kg bag include Chama, Chipata, Gwembe, Livingstone, Sinazongwe, Mazabuka and Senanga, which were generally deficit areas.

Compared to maize prices of the same period two years ago, November/December 1995, the average maize price of a 90 Kg bag have generally declined. A decline in average maize prices was recorded for the following provinces, Central from K28, 880 in 1995 to K25, 000 in 1997, Luapula from K24, 924 in 1995 to K23, 700 in 1997, Northern from K38, 557

to K29, 722, Southern from K41, 483 to K37084, Western from K33500 to K32, 400 and Lusaka from K28, 500 to K23, 700 all during the same period between November/December 1995 and December 1997. An increase in maize prices of 40 percent was recorded for Copperbelt, from K29, 000 in 1995 to K40, 714 and Eastern province an increase of six percent from K31, 250 to K33, 313 (see FHANIS report of Jan/Feb, 1996).

Sorghum prices were on the average similar to maize ranging from K12, 000 in Choma to K42, 000 per 90 kg bag in Gwembe and were available on the market in Central, Northern, Southern and North-Western provinces. Millet was primarily found in Northern, Luapula, Central provinces and selected districts of North-Western province. Millet prices ranged between K17, 280 per 90-kg bag in Mbala to K41, 000 in Kalomo. It is worthy noting that most food items were not easily available for purchase in the rural communities. Maize was the most frequently found staple for purchase in the rural market in the southern part of the country. Beans was found on the market in Luapula, Northern and North-Western provinces where prices ranged from K21, 000 to K1 53, 600 per 80kg bag.

### 3.1.6 Risks Associated with Health Conditions (Nutritional Status)

Though there are a number of causes of morbidity in Zambia, this year's VAM has concentrated on the nutritional status aspect since it is an important factor and is both a contributing factor to vulnerability as well as an outcome. This report has only considered the situation during the past 3 years. Considering this data set, districts have been categorised into the following categories:

- i) **Chronic Nutrition Problems:** These are districts who face nutritional problems due to a combination of factors such as accessibility, poor food production due to weather conditions., geographic location and poor access to health facilities. These districts include Chama, Sesheke, Senanga, Kalabo, and most districts in Luapula Province.
- ii) **Nutrition Risk during Drought years:** These are districts with nutritional status related to drought. These districts are drought prone and include Siavonga, Sinazongwe, Luangwa, Chama, and Lundazi. Some of these districts fall under the chronic nutrition status.
- iii) **Low Nutrition Risk:** These are districts with few malnutrition problems. These include most districts on the plateau with relatively high agricultural production compared with other districts.

During the early months of 1998, overall, 14% of the children showed signs of wasting in the rural Zambia. Differences in the wasting rates were observed between provinces and within each province. The highest wasting rates of 22% was reported in Northern province, followed by Luapula (18%), Lusaka rural (17%), Western (15%) and North-Western (14%). Wasting rates were lower than 11% in other provinces. In Central province, Serenje recorded the highest wasting rates of 12%, followed by Mkushi 11%. The lowest proportion of wasted children was in Kabwe rural (9%).

In Eastern province, wasting rates ranged from 0 - 17%. The highest wasting rates were recorded in Chadiza (17%), Petauke (16%) and Chama (1 5%). In Southern province, wasting rates ranged from 0 - 13%. The highest proportion of wasted children were found in Choma district (13%), followed by Kalomo (9%) and Siavonga. Elsewhere, only 1 in 20 children were wasted.

In Western province, the proportion of wasted children was high and ranged from 10% to 24%. Kaoma reported the highest percent of wasted children (24%), followed by Lukulu and Kalabo at 15% each while in Northern province, wasting rates ranged from 8% - 33%. In Western province, it ranged from 10% to 24% and North-Western the from 11 %- 21 %. These figures shows to a larger extent higher rates of malnutrition across the country, more so in Western province as well as some districts in Southern and Northern Provinces.

## Section 4: Assessment of Food Accessibility

### ***4.1. Baseline Period (1985-1995)***

Using an average of ten-year income data (1985-1995), indications are that generally, most districts fall below the minimum food requirements. Out of a total of fifty-seven districts in Zambia, only twelve had sufficient income to meet the basic food requirement per capita and interestingly enough, all are in the rural areas getting most of their income from crop and livestock production. The twelve districts are Kabwe Rural, Mkushi, Mumbwa, Serenje (Central Province); Ndola Rural (Copperbelt Province); Chadiza, Chipata, Katete (Eastern Province); Choma, Gwembe, Kalomo (Southern Province) and Kaoma (Western Province). The table below shows the estimated income levels during the base period from the seven sources of income as described above.

**Table 3: Estimates of Total Income and a Comparison with the Minimum Income (1985-1995)**

District Name	Per Capita value of min. Income Threshold.	Average Total Income Witbout Wages( Rural Income)	Average Total Income with Wages & Transferes	% Difference between Min. Income Requirement & Total Income	Category
Chilubi	94,047.92	5,443.16	6,847.63	-93	Significantly Below Minimum Income
Nchelenge	65,883.59	5,224.58	6366.47	-90	
Mwense	65,883.59	7,893.69	8,905.35	-86	
Samfya	65,883.59	8,283.29	9,507.18	-86	
Kawambwa	65,883.59	9,327.82	10,704.26	-84	
Kitwe	98,994.44	2,525.33	16,870.89	-83	
Luanshya	98,994.44	2,775.35	17,130.02	-83	
Ndola Urban	98,994.44	2,668.64	17,236.20	-83	
Kasama	94,047.92	14,652.60	15,963.50	-83	
Mporokoso	94,047.92	15,810.31	17,214.78	-82	
Chingola	98,994.44	5,636.75	21,294.02	-78	
Kalulushi	98,994.44	4,867.38	21,435.05	-78	
Kaputa	94,047.92	18,794.42	20,237.32	-78	
Luwingu	94,047.92	19,095.82	20,299.81	-78	
Mufulira	98,994.44	3,749.93	22,428.61	-77	
Mwinilunga	59,642.28	12,651.15	13,623.32	-77	
Kasempa	59,642.28	12,895.72	14,111.03	-76	
Solwezi	59,642.28	12,497.36	14,143.57	-76	
Luangwa	74,914.09	16,044.42	19,698.17	-74	
Mbala	94,047.92	25,380.49	26,522.49	-72	
Lusaka Urban	74,914.09	2,172.04	21,860.72	-71	
Chinsali	94,047.92	25,716.74	26,947.74	-71	
Mpika	94,047.92	28,552.73	29,752.73	-68	
Isoka	94,047.92	32,157.68	33,590.58	-64	
Zambezi	59,642.28	21,730.58	22,944.05	-62	
Kabompo	59,642.28	21,912.27	23,158.45	-61	
Mongu	80,405.65	29,562.59	31,974.01	-60	Average
Chililabombwe	98,994.44	24,301.34	41,091.01	-58	
Siavonga	67,978.52	27,220.85	29,445.75	-57	
Mansa	65,883.59	27,535.82	28,735.82	-56	
Kalabo	80,405.65	36,551.57	37,531.85	-53	
Sinazongwe	67,978.52	29043.62	32,436.47	-52	
Mufumbwe	59,642.28	29,354.26	30,681.69	-49	
Lukulu	80,405.65	40,638.75	41,903.51	-48	
Livingstone	67,978.52	17,438.12	36,780.57	-46	
Senanga	80,405.65	43,092.42	44,036.25	-45	
Sesheke	80,405.65	42,941.66	44,123.95	-45	
Petauke	74,320.92	55,091.90	56,473.68	-24	
Kabwe Urban	80,518.37	53,225.61	65,802.39	-18	
Lundazi	74,320.92	62,040.24	63,451.75	-15	
Chama	74,320.92	66,137.58	67,378.58	-9	
Lusaka Rural	74,914.09	64,107.39	67,882.85	-9	
Mazabuka	67,978.52	63,156.23	65,410.98	-4	
Monze	67,978.52	64,090.47	66,078.10	-3	
Namwala	67,978.52	65,440.31	66,341.27	-2	
Ndola Rural	98,994.44	101,753.35	103,077.69	4	Above Minimum Income Threshold
Kaoma	80,405.65	82,508.54	83,802.51	4	
Chipata	74,320.92	81,561.50	82,943.49	12	
Kabwe Rural	80,518.37	92,873.15	94,445.23	17	
Katete	74,320.92	100,659.61	101,928.02	37	
Choma	67,978.52	92,013.17	94,004.37	38	
Gwembe	67,978.52	92,751.74	93,593.78	38	
Serenje	80,518.37	113,070.08	114,339.59	42	
Mumbwa	80,518.37	130,057.44	132,186.39	64	
Kalomo	67,978.52	128,644.60	129,740.33	91	
Mkushi	80,518.37	171,233.08	172,686.89	114	
Chadiza	74,320.92	231,203.07	232,607.54	213	

The rural income alone in these areas is normally sufficient to meet food needs and based on this, they would be considered non-vulnerable. Cereal production is the major source of income only in Mkushi district while in other districts, except Chadiza, which normally relies heavily on cash crops livestock, is the main source of income.

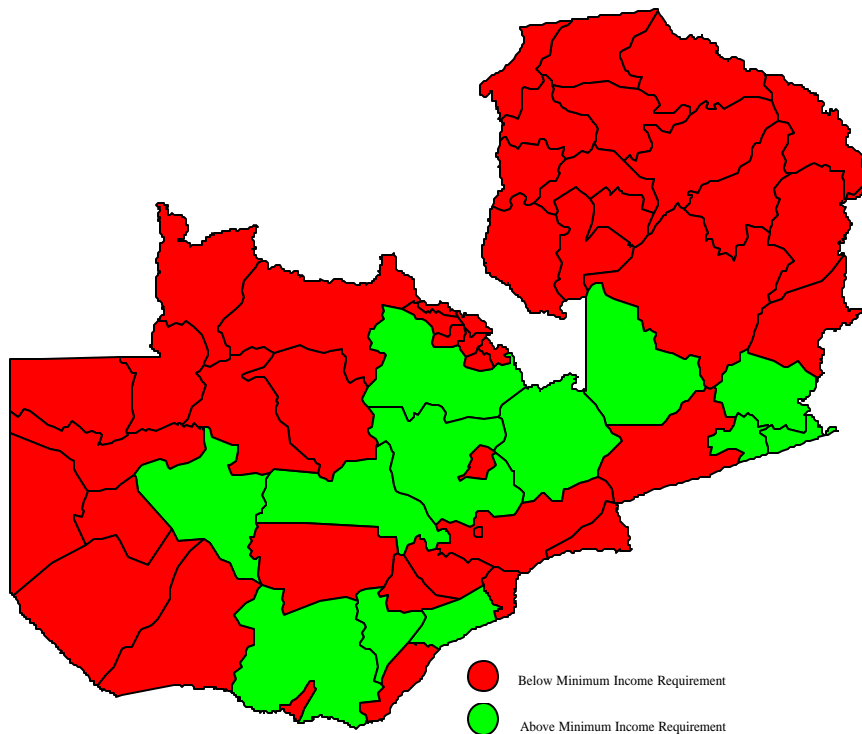
Four districts namely Mkushi, Mumbwa, Chadiza and Kalomo earn income above 60% of the minimum requirement and could be considered the most food secure with respect to income. This also suggests that they have extra money to

spend on other non-food commodities. Of these, Chadiza had the highest income followed by Mkushi. With respect to income, all districts in the Northern, Luapula, and a good part of North western, Western, Southern and Copperbelt Provinces would be considered normally income deficit and therefore food insecure, though the extent varies.

Most income deficit areas are All Luapula districts (except Mansa), Northern Province, Luwingu, Mporokoso, Kaputa, and Kasama, North-Western Province, (Mwinilunga, Solweji, Kasempa,); and Luangwa district in Lusaka Province. Table 4 shows that out of the forty-five districts failing below the minimum requirement, half of them have income below 70% of minimum requirement indicating a high level of vulnerability.



**Figure 8: Percentage difference between Total Income and Minimum Income Threshold: Base Period (1985-1995)**



#### **4.2 Current Period (1997/1998)**

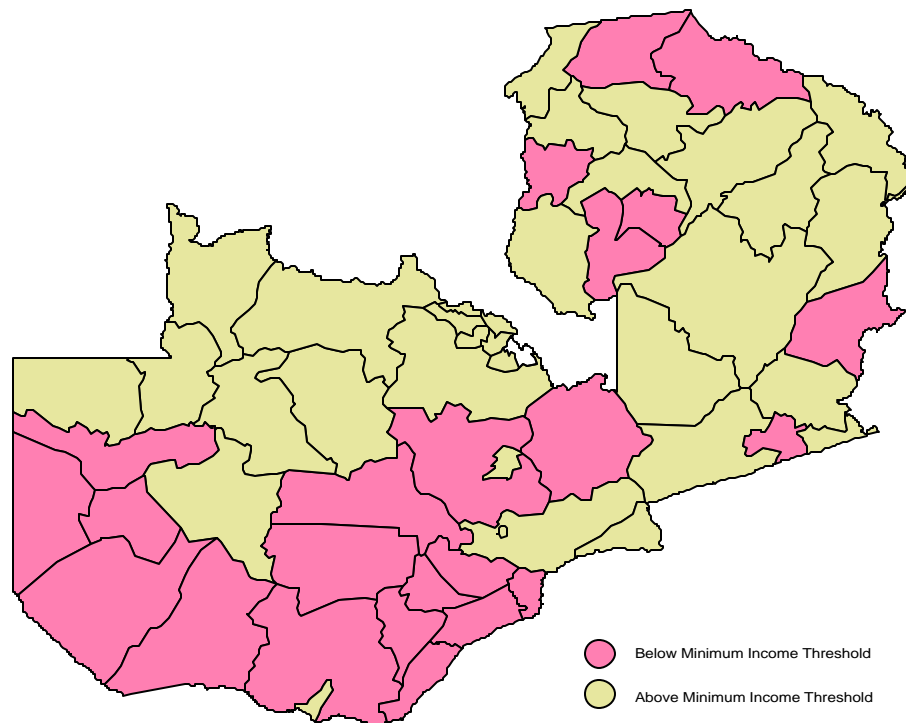
In almost all districts in Zambia, most people are less able to cope with shocks to food security than they were during the normal period (1985-1995). Generally there has been reductions in total disposable income in all the districts, depicted by negative percentage changes for the last decade. This situation is also generally true when looking at rural households. The main reasons for declines in real incomes include: inflation, the economic reform programme which is being undertaken resulting in job losses as well as the liberalization of the economy, which has taken most rural farmers by surprise and seem to require a long adjustment period. Another reason for the decline in income has been the crop losses during the current period due to floods in the major crop growing regions of the Southern, Eastern, Central and Eastern Provinces.

The table below shows income levels and percentage difference from the minimum income threshold during the 1998 season.

**Table 4: Current Total Income compared with the Minimum Income Requirement**

District Name	Per Capita value of min. Income Threshold.	Average Total Income	% Difference between Min. Income Requirement & Total Income	Category
Kalomo	67,978.52	162,969.88	-139	Significantly Below Minimum Income
Chingola	98,994.44	10,294.90	-89	
Mufulira	98,994.44	10,570.45	-89	
Kalulushi	98,994.44	11,662.22	-88	
Luanshya	98,994.44	12,554.25	-87	
Ndola Rural	98,994.44	13,668.95	-86	
Ndola Urban	98,994.44	10,570.45	-86	
Kasama	94,047.92	20,071.89	-78	
Lusaka Urban	74,914.09	23,810.92	-72	
Luangwa	74,914.09	22,517.69	-69	
Isoka	94,047.92	28,812.52	-69	
Lusaka Rural	74,914.09	20,840.92	-68	
Mufumbwe	59,642.28	20,985.63	-64	
Kasempa	59,642.28	21,272.28	-64	
Mporokoso	94,047.92	35,333.10	-62	
Chinsali	94,047.92	36,219.04	-61	
Mpika	94,047.92	35,780.67	-61	
Kitwe	98,994.44	39,475.42	-60	Average Significantly Below
Mumbwa	80,518.37	128,261.36	-59	
Chadiza	74,320.92	30,256.18	-59	
Chipata	74,320.92	33,013.02	-55	
Chililabombwe	98,994.44	46,945.70	-52	
Chama	74,320.92	35,036.89	-52	
Zambezi	59,642.28	33,018.54	-44	
Luwingu	94,047.92	52,902.83	-43	
Kabompo	59,642.28	41,028.66	-34	
Kabwe Urban	80,518.37	57,045.52	-29	
Solwezi	59,642.28	42,397.91	-28	
Serenje	80,518.37	59,020.76	-26	
Livingstone	67,978.52	51,075.76	-24	
Kaoma	80,405.65	63,441.61	-21	
Kawambwa	65,883.59	52,508.06	-20	
Mwinilunga	59,642.28	50,945.82	-14	
Nchelenge	65,883.59	65,747.02	-0.21	
Petauke	74,320.92	74,240.13	-0.11	
Mansa	65,883.59	67,859.49	3	Above Minimum Income Threshold
Kabwe Rural	80,518.37	83,334.43	3.5	
Lundazi	74,320.92	79,065.43	6	
Mbala	94,047.92	104,894.26	11	
Mongu	80,405.65	94,415.26	17	
Mwense	65,883.59	47,372.13	20	
Senanga	80,405.65	98,457.91	22	
Mkushi	80,518.37	103,389.09	28	
Sesheke	80,405.65	105,144.38	30	
Sinazongwe	67,978.52	100,114.61	47	
Kalabo	80,405.65	119,905.98	49	
Chilubi	94,047.92	146,550.29	55	
Katete	74,320.92	117,707.34	58	
Samfya	65,883.59	122,210.15	85	
Choma	67,978.52	134,868.86	98	
Mazabuka	67,978.52	141,570.68	108	
Lukulu	80,405.65	179,572.39	123	
Kaputa	94,047.92	210,677.44	124	
Monze	67,978.52	157,618.54	131	
Gwembe	67,978.52	177,785.30	161	
Siavonga	67,978.52	182,755.58	168	
Namwala	67,978.52	248,938.13	266	

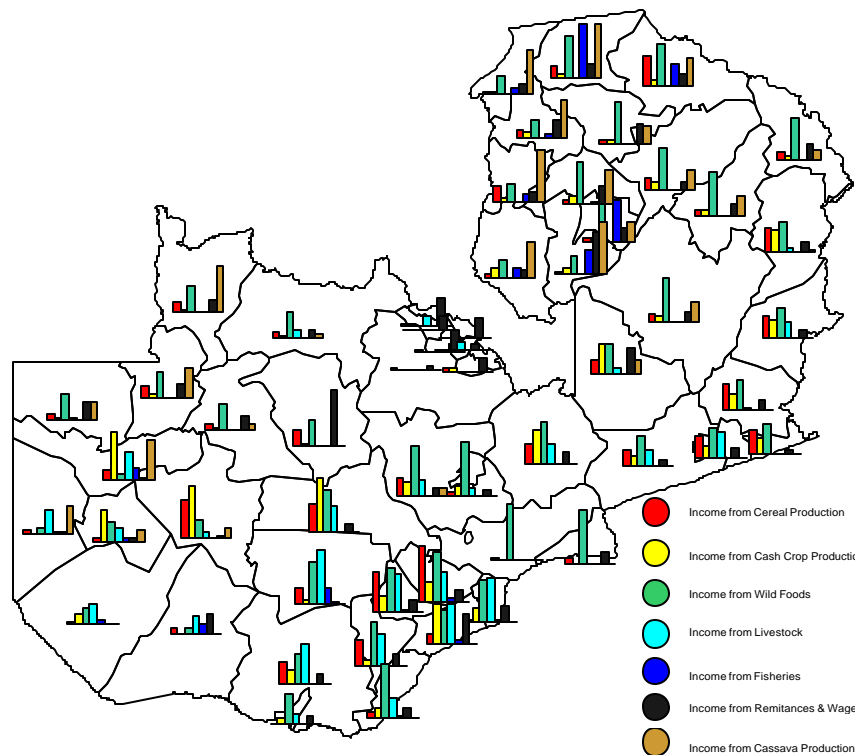
**Figure 9: Current Income Analysis: Percentage Difference between Total Income and Minimum Income Threshold**



The figure above depicts results, which are consistent with what would be expected given the nature of the agricultural season. Some of the districts in the Southern, Western, Eastern, Luapula and Northern provinces have an income per capital that is below minimum income threshold. This result is consistent with what would be expected given the agricultural conditions during the current season. Most of the Southern region faced drought and crop production (which is the main livelihood system) did not perform adequately. It is also important to mention that livestock has been identified as one of the main contributors to total income, however considering the high risk associated with livestock disease, it is expected that contribution from livestock have been reduced.

Most districts are getting above normal income on a per capita basis even though this income may be below the minimum requirement. This could be attributed to the fact that there has been increased production of high valued crops. For Northern Province, there has been an increase in the production of cassava. Based on this data alone, one would say, most of the population has an above average per capita income this marketing season.

Figure 10: Sources of Livelihoods by Districts



Considering the different livelihood systems as depicted in the above figure, it can be concluded that the contribution of cereal production to total income has been reduced this year if compared with last year. This has been a significant reduction. Income from livestock has been significant in Central and Southern Provinces, however, household surveys conducted revealed that most of the livestock population at the time of the survey, had been affected by diseases over the past few months, hence rendering most of the population in these areas vulnerable. Income from cassava is significant in Luapula and some of the districts in Northern Province. This is obvious and consistent with the eating patterns of the people in the region. Income from wild foods has also been significant in Southern Province where as income from cash crops were average in Central, Southern, and Eastern Provinces. This therefore implies that the diversification process has not taken root in most rural communities and as such, cereal production still dominates rural agricultural production. It therefore suffices to mention that there exists no tangible evidence that there has been a shift from cereal to cash crop production.

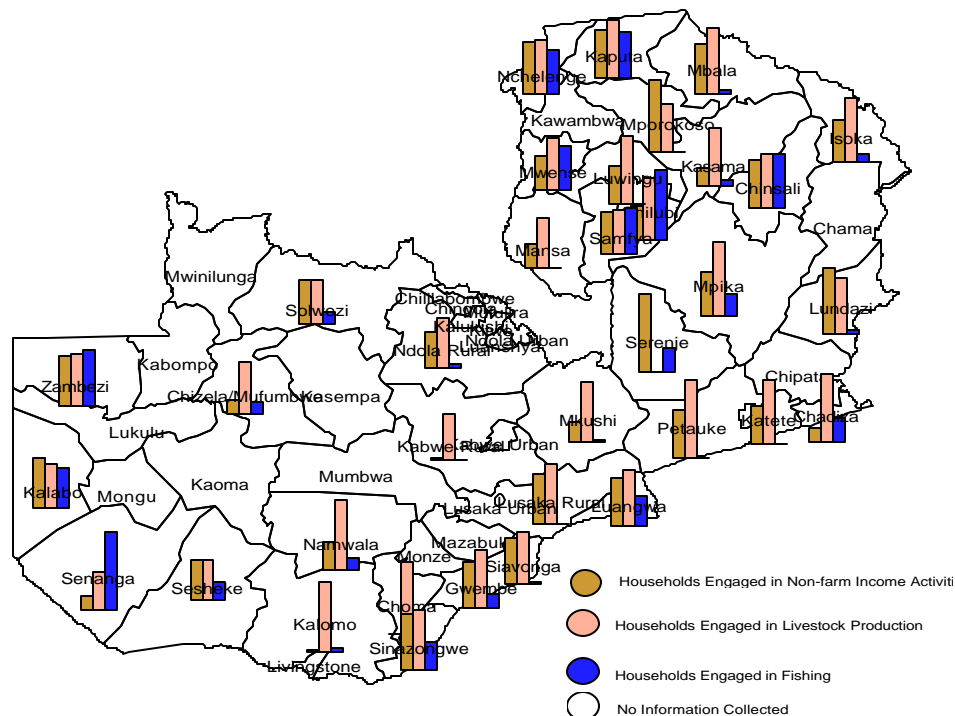
## **Section 5: Food Availability and Livelihoods in Selected Districts at the Household Level During the 1997/98 Season (Field Investigation Results)**

A Food Needs Assessment was conducted in districts that were identified by the VAM Steering Group. The results that are presented in this section represent the findings of this survey and have been used in this document to verify the results of the VAM Analysis as obtained in Section 3.

### ***5.1 Food Accessibility and Major Livelihoods.***

From the surveyed districts, the major livelihood in the districts is crop production. At least 90 per cent of the households in all the districts are engaged in crop production. This therefore implies that due to the vagaries of weather during the season in question, most of these people's source of livelihood has been heavily affected. This result coincides with the general VAM analysis where most of the districts largely depend on crop production as a source of income for their families. Fishing was also found to be a major livelihood in Luapula and northern provinces. Fishing was also found to be prevalent in Siavonga, Sinazongwe, Zambezi, and Mpulungu districts, confirming the VAM analysis. In terms of non-farm income sources, the following map depicts the findings of the Field visits:

Figure 11: Sources of Non-Farm Income :Results from Field Assessment .



From the above map, the following can be deduced:

- i) Most of the households in Northern and Luapula Provinces obtained their income from fishing and was regarded as an important source of livelihood.
- ii) In general, all the households in the selected districts had considerable reliance on no-farm income generating activities.
- iii) Reliance on income from livestock was significant among households in the Southern Province, as well as Western Province, though fishing was dominant in Senanga district as well as Zambezi district in North-western Province.

## Section 6: Conclusions and Recommended Programme Initiatives

### 6.1 Conclusions

The following conclusions can be drawn from the analysis:

- Comparing this year's income levels to the base period, it is evident that the population is better off now than before as indicated by the higher incomes they are receiving, in comparison with the minimum income threshold. This is as a result of the fact that more farmers diversified to higher value crops such as soybeans, paprika, and cotton. In addition, farmers are now receiving economic prices as opposed to the centrally determined prices during the base period.
- Most of the districts in the Southern Province ( Kalomo, Choma, Monze, Sinazongwe, Siavonga, Gwembe ); Western ( Lukulu, Kalabo, Senanga, Sesheke ); Central ( Mumbwa, Kabwe rural, Serenje ); Eastern ( Katete, Lundazi ); Luapula ( Mwense, Chilubi, Luwingu ) and Northern ( Kaputa and Mbala ), have an income per capital that is below minimum income threshold. This result is consistent with what would be expected given the agricultural conditions during the current season. Most of the Southern region faced drought and crop production (which is the main livelihood system) did not perform adequately. It is also important to mention that livestock has been identified as one of the main contributors to total income, however considering the high risk associated with livestock disease, it is expected that this contribution has been reduced, hence further reducing the total disposable income of these households. In general, incomes are low, food relief intervention would therefore be required as any market driven interventions to improve food security would not yield the desired results. Interventions in terms of food relief should initially target those districts with highest levels of vulnerability as indicated in this report. Though, this analysis was based on a district situation, the results obtained are quite similar with what was obtained during the Food Needs Assessment field visits. Most of the households in Northern and Luapula Provinces depend on fishing as their main livelihood system, but generally most of the districts rely on non-farm income activities to supplement their incomes. It is therefore important to identify these activities and design programme activities that would enhance these non-farm income initiatives.

### 6.2. Recommendations

To improve the results of such analysis in future, the following are recommended:

- Review the minimum income threshold and develop district based minimum food requirements.
- Standardise the measurement of Vulnerability to include calorie requirements as opposed to income.
- There is also need to yearly extend the Rapid Vulnerability Assessments to more districts. This will provide more detailed information for specific project action.

- There is still need to improve the data sets for Cassava, Livestock, and Fisheries Production. The collection of this information should be done in close liaison with the Ministry of Agriculture, Food and Fisheries.
- Participatory and Rapid Rural Appraisals, as well as poverty ranking exercises should be conducted frequently, particularly in areas identified as most vulnerable to food insecurity. The results of such exercises should be input into the monthly or quarterly reports on vulnerability in targeted districts.

The VAM results have brought out specific policy implications regarding the following:

- vi) **Targeting:** This report has identified that most people in Southern, Western and parts of Luapula provinces are vulnerable to food insecurity. This therefore implies that the distribution of scarce resources should be targeted towards the most vulnerable within these geographical locations. People faced emergency conditions during these periods and whose livelihoods have been eroded over time should be targeted.
- vii) **Monitoring:** For those districts characterized as vulnerable and targeted, periodic monitoring is essential. The would require specific monthly field visits to obtain specific information in coping mechanisms of being employed and the impact of intervention strategies in people's livelihood systems. VAM members could collect this information through NGO's operating in these areas and Rapid Rural Appraisal missions.
- viii) **Disaster Management:** This is a rather important aspect that should be strengthened within the newly established Disaster Management and Mitigation Unit at the Office of the Vice President. Understanding the nature of disasters and vulnerability should be strengthened and integrated within NDMMU.
- ix) **Market Environment:** The market undoubtedly plays an important part in this system, especially in times of shortfalls. Consideration for provision of credit to local traders in targeted (vulnerable) areas should be considered. Market price information should be widely disseminated.
- x) **Transport and Communications:** The issue of infrastructure (roads, bridges), development especially in districts, which are highly inaccessible, should be brought to the attention of government for intervention.

### **6.3 Suggested Future VAM Analysis**

Since the inception of VAM analysis in Zambia a number of changes have been made. During the 1995 and 1996 VAM analysis, there has been debate on the methodology of VAM. Since there, there has been a movement towards consensus on what methodology should be used. For the past two years, (1997 and 1998) an income based VAM analysis has been used. This methodology, though user-friendly in terms of being able to translate all variables into income, other factors such as inflation, and the general macro-economic environment pertaining at any particular time have had an effect on the results. It is therefore important to consider other measurements such as calorie requirements as standard measures of vulnerability and food insecurity. This methodology is being used in Mozambique, and given the common goal of trying as much as possible to standardize vulnerability measurements, this methodological approach should be considered in the next VAM.



## 6.4 Recommended Programme Initiatives

Given the results of the analysis, and the outcome of the Food Needs Assessment Field investigations, the following programming initiatives are suggested

1. **Improvement of Livestock Population through Restocking:** It is quite evident that most of the districts, particularly in Southern, Eastern and Central provinces consider livestock as their main secondary source of livelihood, and yet during field verification visits, it was clear that most of the livestock population has been lost due to diseases. Systematic programmes that are targeted towards improving the livestock, or restocking should be considered. One such initiative would be to consider monetisation of food aid to create a livestock specific credit scheme aimed at improving the livestock population in these districts, through provision of vaccination services or restocking. Another initiative is to enhance and improve the targeting under the ASIP livestock development activities to concentrate on those areas that have comparative advantage in the production of livestock. General distribution of food to selected households in the most vulnerable areas.
2. **Improved small-scale fisheries Development:** This is another important source of income as well as food among the households in Western, Southern and Luapula districts. However, currently, particularly in Siavonga and Sinazongwe districts of Southern Province, most indigenous households are not involved in fishing that would enhance their livelihood, due to the amount of initial income needed to purchase the required inputs. A similar credit revolving fund specific for small indigenous households could be used.
3. **Improvement of accessibility and reduce isolation:** A number of potentially productive districts are not productive due to the problem of accessibility and isolation. Most private traders do not even visit these areas. It is therefore important to initiate deliberate programmes that would improve accessibility to these areas by improving community roads as well as feeder roads. This could be achieved through the Food-for-Work programme in conjunction with the ROADSIP programme being implemented by government.
4. **Improvement of Health and Nutrition Conditions:** The health of the population in any environment is a major determinant of the productivity of such a community. In all cases, areas with high incidences of disease and malnutrition are synonymous with low productivity. It is important to ensure that this trend is reversed by ensuring that deliberate efforts are targeted towards extending health infrastructure to most communities, through the Food-for-Work Programme, and complimented by government through the provision of medicines, personnel and equipment. Nutrition education programmes should also be encouraged in districts with high incidences of disease as identified in this report.
5. **Irrigation Schemes:** Irrigation facilities could be expanded in potentially high production areas but drought prone. This could be achieved through the Food -for -Work Programme.
6. **Enhancement of Agricultural Production:** Efforts should be made in encouraging crop diversification as well as soil and water conservation. This could be well done under the ASIP programme. It is envisaged that this would invariably improve crop production in improve the livelihoods of most rural households.

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